Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Usage of the Public Switched Network	)	CC Docket No. 96-263
By Information Service and Internet	)	
Access Providers	)	

COMMENTS OF SPRINT CORPORATION

Sprint welcomes the opportunity to address the issues raised by the Commission in its Notice of Inquiry in the above-captioned proceeding (FCC 96-488, December 24, 1996, ¶¶311-17). Information services and access to the Internet are increasingly important elements of this nation's information infrastructure, and the Commission is to be congratulated for opening this inquiry.

One preliminary observation is in order. In view of the fact that ESPs, by definition, are not communications common carriers,[1] and that because of the ESP exemption from access charges, ESPs utilize jurisdictionally intrastate local business line offerings of the LECs, the Commission's role in ensuring efficient handling of ESP traffic and adequate cost recovery for LECs is necessarily limited. Nonetheless, by gathering comprehensive information on the impact of information and Internet access services on the use of the public switched network through this NOI, the Commission can perform a valuable function for the industry and other regulatory agencies.

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[1] Second Computer Inquiry, 77 FCC 2d 384, 84 FCC 2d 50 (1980), 88 FCC 2d 512 (1981), affirmed, CCIA v. FCC, 693 F.2d 198 (D.C. Cir. 1982).

Sprint agrees with the Commission's observation in ¶313 that the circuit-switched voice network was not designed for data calls. The common carrier and ESP industries have developed packet-switched networks specially designed for data and information applications. Nonetheless, many users of information services lack the capability to directly access these networks or simply do not use enhanced services enough to make such access economically worthwhile. Since the birth of enhanced services, such users have instead relied on the circuit-switched voice network for access to ESPs. Such use of the public switched network is of no particular consequence so long as the usage characteristics (e.g., call duration and time of day) are compatible with the usage of the network for ordinary voice calls. Clearly, the cause for concern underlying this NOI is the burgeoning use of the voice network for access to the Internet, a use that is characterized by calls of much longer than average duration. Based on a study of Sprint's local subscribers in the Orlando area, subscribers who use their lines for ordinary voice calls during the 8-10 p.m. period averaged 2.23 CCS usage, with typical holding times in the one to four minute range, while subscribers who use their lines for Internet access had an average usage of 18 CCS with a 30 minute average holding time. These long holding time calls, if sufficient in volume, can undercut the assumptions on which the current local network is engineered and priced.

In general, local networks are designed to handle peak busy-hour loads of approximately three CCS per line (five minutes per line per hour). For the Sprint LECs, average peak hour traffic is already approaching four CCS and in some offices is on the

order of 4.5 CCS per line. Although this overall increase is not of "crisis" proportions, it has caused congestion in particular instances.

Peaking of traffic beyond normal design limits can cause congestion (perceived by the end-user as a delayed dial tone, a "fast busy" signal, or a busy signal on the terminating end of the call) at many different points within the network: (1) concentration devices such as digital loop carrier between the end users' premises and the central office; (2) the central office switch serving the end user; (3) local interoffice trunks; (4) the central office switch serving the enhanced service provider; and (5) the lines between that switch and the ESP. These points are illustrated in Diagram 1 attached.

Assuming this traffic is kept on the switched voice network, the method of relieving congestion depends on where in the network the congestion occurs. Easing congestion in the loop plant serving the end users (point (1) above and in Diagram 1) requires adding new circuits between the intermediate concentrators and the end office. Within the central office switch serving the end users (point (2)), traffic can be deconcentrated by adding more line concentrating modules (LCMs) at the front end of the switch[2] or by increasing the number of links between the LCMs and the line group controllers (LGCs) (if those links are not already at the maximum permissible levels). Congestion in the interoffice network (point (3)) requires activation of additional interoffice trunks to the switches that serve the ESPs. If congestion occurs in the terminating switch serving the ESP (point (4)), it can be eased by any of several means: (a) spreading the ESP's traffic among several different LCMs; (b) increasing the number

[2] See Diagram 2 for a depiction of a typical central office switch.

of LCMs and, if possible, the links between the LCMs and LGCs; or (c) encouraging the ESP to purchase trunk-side connections to be the central office switch or ISDN primary rate interface (PRI) connections in lieu of ordinary line-side loops. Finally, to the extent that the congestion occurs in the lines between the end office and the ESP (point (5)), the ESP can order additional lines to eliminate the congestion.

Congestion at all points other than (1) on Diagram 1 can also be relieved by bypassing, as much as possible, the switched voice network. This can be done in the central office switch at the originating end of the call, by routing calls destined to ESPs to a data or packet switch and delivering the call from that switch to the ESP on a packetized basis over high-speed data lines. If there is a congestion problem in the originating central office switch as well, and if the LEC can identify particular subscriber lines that have very long hold times (and thus may be used for long-duration calls, such as to an Internet service provider), such lines can be connected to a device placed on the front end of the switch that will then screen calls to ESPs and route such calls to an ATM switch for onward transmission as described above, or route the call back to the originating central office switch if it is a call destined to a number other than that associated with an ESP. Another possible solution to the congestion problem involves the use of ADSL loops from the end user premises to a data or packet switch. Such loops permit much higher speed data interfaces than those available with ordinary voice service, and also bypass the switched voice network.

Thus far, the Sprint LECs have experienced only two major congestion problems that can be attributed to Internet access. Both occurred shortly after a major Internet

access provider commenced offering flat-rate, unlimited-use access to the Internet. In both cases, the congestion was most apparent in interoffice trunks, and the LECs added a substantial number of additional trunks to accommodate the sudden spike in traffic levels, at a cost ranging between $350,000 and $400,000 for each occurrence. In one of these cases, the Internet access provider also had an insufficient quantity of lines to accommodate the sudden upsurge in traffic, and it ordered a substantial number of lines in order to ease the number of busy signals and customer re-dials its customers were encountering. Sprint has been able to identify five other cases of slow dial tone or congestion during 1996 that it believes is related to growth in access to the Internet. The estimated costs of the equipment necessary to resolve these problems ranged from $3,000 to $75,000.

It is unclear to Sprint whether the advent of unlimited-use flat-rated pricing by Internet access providers has produced a one-time spike in the number of Internet access calls and the hold time of such calls, and that normal growth in the local network will take place hereafter, or whether demand for Internet access and other information services will continue to have an upward impact on system average holding times and will result in permanent increases in the cost of handling this traffic. In either case, given the fact that ESPs are not communications common carriers and are exempt from interstate access charges, the problems of cost recovery by the LECs, if any, are problems of the level and/or structure of local rates and are within the jurisdiction of the state regulatory commissions. It is possible that if congestion proves to be such a serious problem that the access of end users to interstate common carrier services is significantly impaired, the

Commission might have grounds for exercising jurisdiction if the states fail to act in a manner that permits efficient handling of this traffic. However, Sprint does not believe that the congestion problem is so serious today that the Commission should even entertain assertion of such jurisdiction at this time. Only if the problem becomes more serious and the states have irresponsibly refused to allow the LECs to redesign their rates so as to enable them to correct the congestion problem should the FCC consider usurpation of a matter that is normally within the exclusive jurisdiction of the state regulatory authorities.

One potential source of congestion – insufficient lines to the ESP – is largely self-correcting. ESPs have a strong incentive to maintain an adequate number of lines to the LEC central office in order to give good service to their customers. While ESPs may, from time to time, be caught short by sudden surges of traffic, this problem should be short-lived.

Other sources of congestion may require rethinking of local rate levels and/or structures in order to ensure that adequate incentives exist to resolve them. As discussed above, one solution to the problem of congestion at the end office switch at the terminating end of the call is to have ESPs purchase trunk side connections or ISDN PRIs instead of ordinary line-side loops. This is the direction in which Sprint's ESP operations are moving. However, some LEC local rate structures discourage ESPs from ordering these types of loops by charging more for such loops than for an equivalent number of line-side loops. LECs employing this rate structure and facing significant congestion problems in the central office switches that serve ESPs may wish to rethink their pricing

of the various types of local loops. If the revenues they forego by reducing their rates for trunk-side or ISDN PRI loops to ordinary B1 line levels is less than the additional costs they would incur in upgrading their central office switches to relieve the congestion, then clearly they are better off with this minor restructuring of their local rates.

Similarly, with respect to other solutions to the congestion problem between the originating switch and the switch on the terminating end of the call discussed above, the LECs face a cost-benefit trade-off between conventional increases in switching and interoffice trunking capacity, and the alternative technologies that route data calls around the switched voice network previously described. The economic tradeoffs may vary for each local calling area, depending on the amount of congestion that is occurring now and can be expected to occur in the future. Where congestion occurs on the originating loop – at intermediate concentration points between the end user's premises and the LEC central office – the only practicable solution is to deploy additional copper or fiber between the points of concentration and the central office.

For LECs that do not employ local measured rates in their local rate structures, the source of funds to offset the costs of dealing with information services-related congestion is the revenues they receive from selling additional business lines to ESPs and additional residential or business lines to end users that access the Internet. Depending on the level of those rates in relation to underlying costs, they may or may not be sufficient to cover the costs of whatever plant changes are required for efficient handling of ESP traffic. However, as discussed above, that is a matter that, at least in the first instance, is between the LECs and state regulatory commissions. Aside from possible intransigence on the

part of the state commissions to allow ILECs to establish rate levels and structures that adequately recover their costs, Sprint is aware of no regulatory barrier at either the federal or state level that might prevent LEC cost recovery or the deployment of alternative technologies for handling information services and Internet traffic.

Respectfully submitted,

SPRINT CORPORATION

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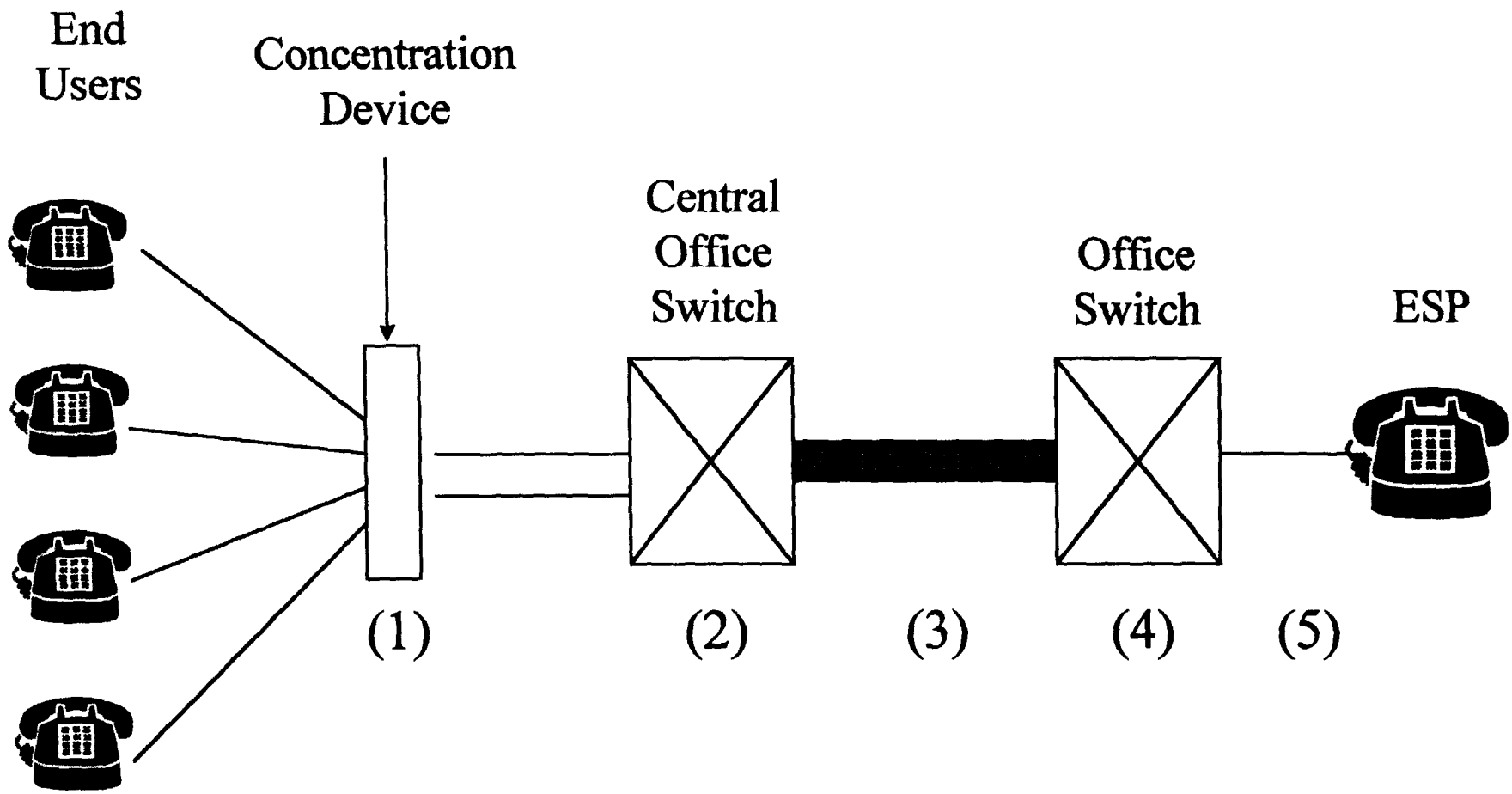
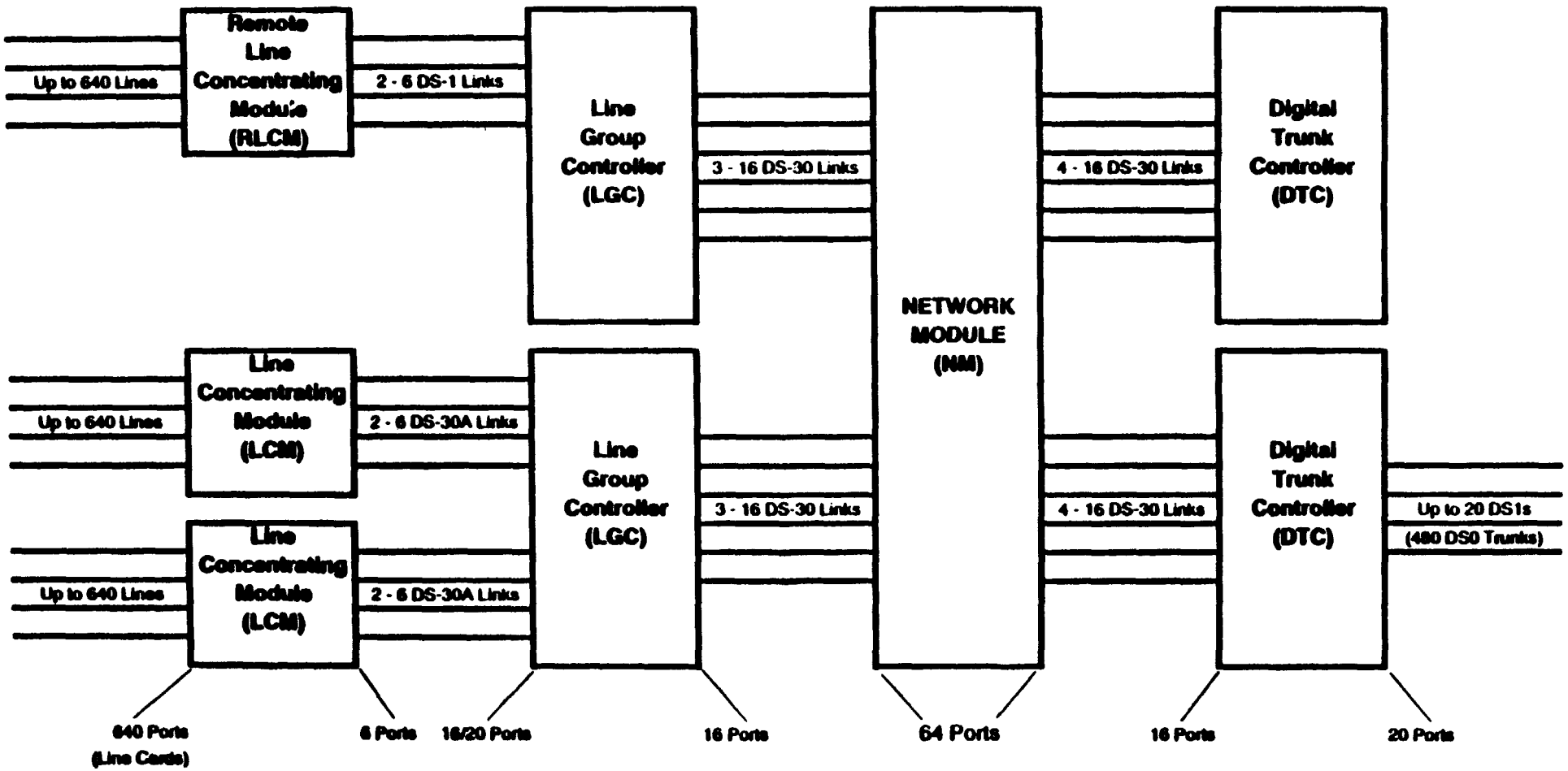
March 24, 1997

Possible Congestion Points In Local Network



SIMPLIFIED DIAGRAM OF DMS-100 SWITCH



CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing **Comments of Sprint Corporation** was Hand Delivered or sent by United States first-class mail, postage prepaid, on this the 24th day of March, 1997 to the below-listed parties:

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Common Carrier Bureau
Federal Communications
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Washington, D.C. 20554

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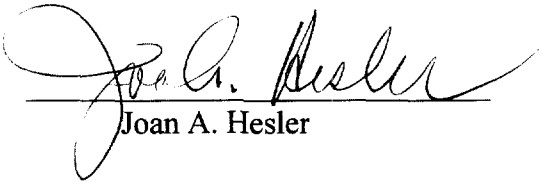

Joan A. Hesler

* Two copies delivered.